AMENDMENTS TO THE SPECIFICATION:

Please replace the second paragraph on page 1, with the following amended paragraph:

While using CAD/CAM applications it is often desirable to model the spatial inclusion or total [[area]] volume a moving part will occupy during travel. The spatial inclusion of a moving part can be referred to as the swept volume. It is useful to determine the envelope or boundaries of a swept volume in order to design in adequate clearances for a part. Clearances are necessary, for example, to avoid unanticipated contacts of a part in motion with surrounding objects. In addition, accurate modeling of a swept volume allows for efficiency in terms of space cost. It is often useful to design a feature as compact as possible.

Please replace the third paragraph on page 1, with the following amended paragraph:

In some currently available systems, parts in motion can be modeled using multi-instantiation of the moving object. This technique produces models of a part at several instants during the part motion. As the number of instantaneous models produced increases the smoother a transition from one model to the next. Acceptable quality using [[his]] these techniques tends to be processor intensive, requiring the creation of multiple images of the part.

Please replace the second paragraph on page 2, with the following amended paragraph:

In general in one aspect the invention includes generating a polyhedral representation of a computer modeled object and representing motion of the object with a set of position matrices. With this invention a subset of entities [free neighborhood entities] can be determined for each matrix and traces of [[the]] motion of the [free neighborhood] entities can be generated. A representation of the swept volume from the traces can be constructed. The [Free neighborhood] entities can include for example, an edge or a triangle.

Please add the following new paragraph on page 2, after the second paragraph:

--Free neighborhood is an area in which an entity can move, while remaining on the swept volume boundary.--

Please delete the third paragraph on page 2, which starts with "In one embodiment.." and please add the following new paragraph in its place.

--When an edge of a three dimensional polyhedron moves within two portions of a sphere limited by planes of adjacent triangles that meet at the edge, the sphere being outside the material of the object and adjacent to the object, it is in an area in which the edge can move while remaining on the swept volume boundary. Such portions of the sphere are called tangent zones. When a triangle of a three dimensional polyhedron moves within the material of the object which is limited by a plance of the triangle and the half sphere containing the material of the object, the half sphere defined by the circumscribing circle of the triangle, the triangle is in a space in which the triangle can move while being on the swept volume boundary. Such space is called material zone. Free neighborhood of a polyhedral object includes tangent zones and material zones, traces by some of the edges and triangles on the polyhedron. Such edges and triangles are called free neighborhood entities. The swept volume of a polyhedral object can be defined by the traces of selected edges and selected triangles where such edge and triangle selection is determined based on an analysis of movement of edges and triangles through tangent zones and material zones.--

Please replace the seventh paragraph on page 2, with the following amended paragraph:

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Implementations can provide advantages such as the capability of efficiently producing a computer model of the spatial inclusion or total [[area]] volume a moving part will occupy during travel. Other features, objects, and advantages of the invention will be apparent from the description, the drawings and the claims.

Please replace the BRIEF DESCRIPTION OF THE DRAWINGS, on page 3, with the following:

FIG. 1 is an illustration of a computer conforming to this invention.

FIG. 2 illustrates a swept volume calculated in accordance with the process illustrated in FIGS. 6A – 6H.

FIG. 3 illustrates an edge in a polyhedral representation traced through a bend.

FIG. 4 illustrates a polygon submitted to translation.

FIG. 5 illustrates Free Neighborhood Tangent and Material zones.

FIGS. 6A – 6H illustrate a process for the computation of a swept volume.

FIG. 7 illustrates tracking of Free Neighborhood entities.

FIG. 8 illustrates tracking translation of a polygon.

FIG. 9 illustrates forming a swept volume boundary from the translation of Fig. 8.

FIG. 10 is a flow chart of one embodiment of a process for swept volume generation.

FIG. 11 illustrates a swept volume model of a cylinder experiencing translation.

FIG. 12 illustrates a swept volume model of a cylinder experiencing translation and rotation.

FIG. 13 illustrates a piston, connecting rod and crankshaft at rest.

FIG. 14 illustrates a swept volume model of the piston, connecting rod and crankshaft, with the piston and connecting rod showing motion.

Please delete the second paragraph on page 5, which starts with "Referring now to Fig. 2.."

Please delete the third paragraph on page 5, which starts with "Motion can also include.."

Please replace the second paragraph on page 6 with the following amended paragraph:

To represent a swept volume the present invention can determine the boundaries of the volume, i.e. a set of surfaces (2-D entities) that close the volume. This boundary or envelope can be calculated in a computer defined model. At a time *t*, a point belonging to a boundary of a moving object belongs to the boundary of [[its]] the swept volume, [if its neighborhood with respect to the swept volume is not full, that is] if the point is not inside the material of the object. [The neighborhood of a point with respect to the swept volume can be equal to the swept volume generated by the motion of the neighborhood of the point with respect to the moving object.] For a point *p*, a free neighborhood can be a set of points if [belonging to the neighborhood of *p* such that] the neighborhood generated from [[a]] the motion of point p is not inside [full. A [illegible] neighborhood of point *p* is not full if *p* remains on the boundary of the swept volume during the motion and does not enter the interior boundary of the material. A point moving in its free neighborhood can be equivalent to a point sliding along the surface of] the material of the object [modeled].

Please replace the fourth paragraph on page 7 with the following amended paragraph:

Referring now to Fig. 4, a polygon 410 can be [submitted] subjected to a translation. A trajectory 420 of the translation can be tracked, for example, from a point such as a center point in each instantiation 410-413 of the polygon.

Please replace the fifth paragraph on page 7 with the following amended paragraph:

Referring [[now]] to Fig.5, a free neighborhood can be represented by an angular portion of a sphere for edge [for different] types of entities belonging to the boundary of [[a]] the polygon. [For example,] Such a free neighborhood can be based on tangent vector[[s]] 531 and side 541 or tangent vector 532 and side 542 of edge [of a point] 520 [with respect to the adjacent edges]. This is a tangent zone. In the case of a triangle, [an edge 511,] a free neighborhood can be based on the plane of the triangle and the half sphere in the material of the object. This is the material zone. [or material zone can be based on the normal vector 512.]